THE

GREEN MOUNTAIN

REPOSITORY.

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FEBRUARY.

——————Then came cold February, sitting
In an old waggon, for he could not ride,
Drawne of two fishes, for the season fitting,
Which through the flood before did softly slyde
And swim away; yet had he by his side
His plough and harnesse fit to till the ground,
And tooles to prune the trees, before the pride
Of hasting prime did make them burgeon round.

SPENSER.

Numa, who succeeded Romulus as king of Rome, made February the second month of the year, as it is with us, and dedicated it to Neptune. The name is derived from *Februa* or Feralia, which were sacrifices offered to the manes, or the ghosts, of the dead at this season. It was called by our Saxon ancestors *Sprout-kele*, because the *kele wort*, or *cole wort*, which is a kind of cabbage, began in this month to put forth young sprouts, which were used as a pot herb, as the name implies. The Saxons also called it *Sol-monath*, or *pan cake month*, because, on this month, cakes were offered to the sun by our pagan ancestors. The descriptions of this month, given in English books of the seasons, will, in our climate apply better to March than to February. Here the ground is usually covered with snow during the whole month and vegetation seldom begins to start at all till some time in March and frequently not till April.

About the 18th of February the sun enters Pisces, which is the

12th Sign of the Zodiac. This sign, or constellation is represented by two fishes with their tails tied together, which are supposed to symbolize the fishery of the Nile, which usually commenced at this season of the year. Among the Romans the entrance of the sun into Pisces was expected to be attended with storms and high winds. With us, this part of February is usually stormy and windy, but we have no reason to suppose any connexion between these phenomena and the constellation in which the sun is apparently situated.

For the Green Mountain Repository.

COMETS.

Comets seem to have been regarded with wonder in all ages of the world. Their sudden appearance in the heavens, their luminous train and lurid aspect—their rapid motion and short stay, are all calculated to impress the beholder with awe, and to create a suspicion that their visit is of portentious import. The appearance of a comet in the heavens, has, in all former ages, been regarded even by the well informed as the harbinger of some great calamity to the world. But the discoveries and improvements in modern astronomy having made us better acquainted with the motions of these bodies, they are at present regarded rather as objects of curiosity than alarm.

Comets are now believed to be solid opaque bodies, revolving around the sun in very elliptical orbits, and governed by the same laws, which regulate the motions of the planets. They like the planets also shine by reflecting the light of the sun, but as they are much smaller than the planets, they become visible to us only while passing through the portion of their orbit, which is nearest the earth, and, as this portion is but a small part of the whole, it is extremely difficult, by the few observations, which we are able to make upon the comets, to determine either the magnitude of their orbits, or the period in which they go round the sun; and on account of the small quantity of water in them, they are moreover liable to have the form of their orbits changed, and their periodic times very much increased, or diminished, by the attraction of the planets.

About 130 comets are recorded, as having been observed, and have had their elements computed; but the periods of only three

or four, are known with any degree of certainty. The three, whose periods are best known, take the names of the astronomers by whom their periods were ascertained. These are Encke's whose period is 3 years and 4 month's, Biela's, whose period is 6 years and 8 month's, and Halley's, whose period is about 76 years. Encke's comet will pass its perihelion on the 6th of May and Biela's on the 28th of November, of this year, and Halley's comet will pass its perihelion some time in the year 1835. Encke's comet will be visible in South America at this return, but, on account of its great southern declination, it will not probably be visible from any part of the United States. Biela's comet will have a considerable northern declination and will be favorably situated for observation in the United States and is expected to be visible for several months. It will be nearest the earth on the 23d of October at which time its distance from us has been computed to be more than 50 millions of miles. It will be brightest towards the middle of November, at which time it will rise in the northeast about 10 o'clock in the evening and be visible during the remainder of the night.

As the comets move in all directions around the sun, it may be regarded as physically possible that some of those bodies may come in contact with our earth, and this mere possibility has been the source of much alarm to the superstitious and uninformed. But although the possibility of the event may exist, the improbability of it is such as should remove all grounds of fear. It is computed by the celebrated astronomer Dr. Olbers that, if the comets are flying round the sun at random, one of them might possibly come in contact with the earth once in 220 millions of years, by which it appears that the chances against such an event amount almost to infinity.

A comet might it is true, produce effects upon our earth, by passing near it, without coming in contact with it, and the general deluge, epidemic disorders, and various other things, have been ascribed to their influence. But we have reason to believe that the comets are, generally, so small as not sensibly to affect the earth, or the other planets, although they should be very near them. The comet of 1770 is known to have passed very near the satellites of Jupiter without sensibly affecting their motions, and it is asserted that in 1454, a comet passed between our earth and moon, and neither the moon's, nor earth's motion was disturbed.

From Thompson's History of Vermont now in press.

FIRST SETTLEMENT OF VERMONT.

1. During the Colonial and Indian wars, the territory of Vermont, was the great thoroughfare, through which most of their expeditions proceeded and on which many of their battles were fought. Being situated nearly at an equal distance from the French on the one hand and the English on the other, it was constantly exposed to the depredations of both, and became the favorite lurking place of their Indian allies. On this account the settlement of the country had long been regarded as dangerous and impracticable: nor was it until after the complete conquest of Canada by the English in 1760, that any considerable settlements were made. Several places it is true had been previously occupied both by the French and English; but they are rather to be regarded as military posts than actual settlements.

2. The first civilized establishment within the present limits of Vermont was made in 1724, by the erection of fort Dummer in the south eastern corner of the township of Brattleborough. The whole of this tract of country had previously, from time immemorial, been in possession of the native Indians. But it does not appear that, subsequent to the discovery of this territory by Champlain in 1609, the natives had ever resided here in very considerable numbers. The western parts including lake Champlain, were claimed by the Iroquois, the north eastern parts and lake Memphremagog by the St. Francis and other Canadian tribes, and the south eastern parts on Connecticut river were regarded as belonging to the natives in the neighborhood of Massachusetts bay. Some establishments were at times made upon these waters by these several tribes, but it appears that this territory was rather regarded by them as a hunting ground than a permanent residence.

3. Although this tract of country was in some parts mountainous and unproductive, yet the forests were in general well stored with game and the lakes, rivers and smaller streams abounded in excellent fish, which might have afforded subsistence to a very considerable population in the savage state. We must therefore look to some other cause for the scantiness of the population of these regions, than the incapacity of the country to support it; and this is undoubtedly to be found in its local situation with respect to the various Indian nations. Lying on the frontier of several powerful tribes, who were incessantly at war with each other, it

became the bloody theatre of their battles and was constantly exposed to hostile invasions from every quarter. Hence we perceive that the same causes, prevented its becoming a permanent residence of the Indians in earlier times, which operated during the colonial wars to prevent its being settled by the French and English.

4. As early as the year 1752, it was proposed by the English to lay out a township and commence a settlement at Coos on the west side of Connecticut river, where the township of Newbury in this state now lies; and a party proceeded up the river for that purpose. But before they had accomplished their object, they were observed by a party of St. Francis Indians, who, perceiving their design, forbade their proceedings and compelled them to return without accomplishing their object. The Indians at the same time sent a messenger to the commander of the fort at Charleston N. H. stating to him in the most positive terms that they should not suffer the English to settle at Coos; and so much was the resentment of the Indians dreaded at this early period that the undertaking was immediately relinquished.

5 Soon after the erection of fort Dummer several blockhouses were built for the protection of the settlers in that part of Hinsdale N. H. which was situated on the west side of the Connecticut and which is now called Vernon; and before the year 1754, settlements had been commenced in Vermont as far up the Connecticut as Westminster and Rockingham. But their advancement was now stopped by the breaking out of what was called the French war, which continued till the final conquest of Canada in 1760. During this war these feeble settlements were continually harrassed and annoyed by the French and Indians. The inhabitants could not cultivate their fields without being every moment exposed to the deadly fire of a lurking foe. Their block houses were frequently surprised and taken, and the inhabitants either massacred, or carried into captivity.

6. No permanent settlement was effected in Vermont on the west side of the Green Mountains, till after the conquest of Canada by the English. When the French proceeded up lake Champlain and erected their fortress at Crown Point, in 1731, they began a settlement at the same time on the east side of the lake in the present township of Addison. This settlement was, however, broken

up and all the settlers retired, with the French garrison, into Canada, before Gen. Amherst in 1759.

7. Such was the original condition of Vermont, and such were the establishments made within its limits previous to the year 1760. No permanent settlements had been made, at the close of this period, except upon the banks of Connecticut river, in the present county of Windham, and here the settlers were few and scattered, probably not amounting in the whole to more than two or three hundred. But in their expeditions against the French, the English colonists had made themselves acquainted with the fertility and value of the lands lying between Connecticut river and lake Champlain, and the conquest of Canada having now removed the difficulty and danger of settling them, swarms of adventurers began to emigrate hither, and from the year 1760 the population of Vermont began to increase with considerable rapidity.

For the Green Mountain Repository.

ELI WHITNEY ESQ.

The last number of Silliman's Journal of Science contains an interesting memoir of Eli Whitney Esq. the inventor of a machine called the cotton gin, and one of the greatest benefactors of our country. The memoir is from the pen of Prof. Olmsted, and, as the original will not probably meet the eye of the great majority of our readers, we have abstracted from it the following particulars for the Repository.

Eli Whitney was born at Westborough, Mass. on the 8th of December, 1765. His parents belonged to the middle class of society and by the labors of husbandry were enabled to provide well for a rising family. Eli Whitney early manifested a taste for mechanical pursuits and when only twelve years of age he made a fiddle, which was pronounced by good judges to be a remarkable piece of workmanship for a boy of his age. Whitney lost his mother when he was very young, and when he was thirteen his father married a second time. At the age of 15 or 16, when nails were in great demand and bore a high price on account of the Revolution, young Whitney procured the consent of his father and engaged in nail making, which business he pursued during the winter, and labored on the farm in summer. During this time he manifested his ingenuity in making tools for his own use. in

putting in knife blades and in performing many curious little jobs.

At the close of the war nail making became unprofitable and he turned his attention to the manufacture of ladies' bonnet pins and walking canes which he made with remarkable neatness. At the age of 19 he began to think of getting a College education, but being opposed by his step mother, it was long before his father consented. But he finally surmounted all obstacles and in May 1789 joined the Freshman class in Yale College. While in College he supported himself principally by teaching school during the winter. He graduated in 1792, and soon after engaged to a Mr. B. of Georgia, to reside in his family as a private teacher.

On his way to Georgia, after having the small pox at New York, Whitney proceeded in company with Mrs. Greene, the widow of Gen. Greene, who with her family was returning to Savannah, after spending the summer at the north. When they arrived, Whitney's health not being perfectly restored, Mrs. Greene kindly invited him to her house, where, as a requital for her kindness, he procured the virus, and inoculated all the servants of the household, more than 50 in number, and carried them all safely through the small pox.

Before his arrival in Georgia, Mr. B. had employed another teacher, leaving Whitney without business, or resources. Under these circumstances, Mrs. Greene urged him to make her house his home and devote himself to the study of the law or to such other pursuits, as he should think proper. He accordingly entered upon the study of law under her hospitable roof. Mrs. G. was at this time engaged in a piece of embroidery, in which she employed a peculiar kind of frame called a *tambour*, but it being badly constructed and tearing the delicate threads of her work, Whitney set himself to work and made a tambour frame on a new and improved plan and presented it to her. Mrs. G. and her family were much delighted with it and thought it a wonderful proof of ingenuity.

Not long afterwards a large party of gentlemen from the interior of the state, being on a visit at Mrs. G's. the conversation turned upon agriculture and the cultivation of cotton, and much regret was expressed that there was no more expiditious means of cleaning the green seed cotton, than the slow and expensive method of doing it by hand, as their lands, which were unsuitable for the

production of rice, would yield larger crops of cotton, but the expense of separating it from the seed, in the ordinary way, was such as to make it vain to think of raising it for market. While the company were engaged in this conversation, "gentleman, (said Mrs. Greene), apply to my young friend Whitney, he can make any thing." Upon this she showed them her tambour frame and several toys, which he had made, and then introduced them to Whitney himself.

The conversation on this occasion gave a new turn to Whitney's inventive genius and from this moment he bent the whole energy of his mind to the invention of a machine for cleaning cotton. Mrs. Greene, and Mr. Miller, who married Mrs. G. after the death of the general, encouraged the undertaking, and provided Whitney a room and such tools as could readily be procured. With these he set himself to work and, in the course of the winter, he brought his machine to such perfection as to leave no doubt of its ultimate success. Mrs. Greene and Mr. Miller were the only persons, who were admitted to his work shop, or who knew in what manner he was employing himself. When the machine was completed Mrs. G. invited to her house gentlemen from different parts of the State, and it was put in operation in their presence. They were astonished and delighted when they saw that by this machine more cotton could be separated from the seed in one day by a single hand than could be done in the usual way in many months.

Not thinking it prudent to expose their machine to general observation before the patent right should be secured, it was placed under lock and key, but so eager was the populace to become acquainted with it, that they broke open the building by night and carried off the machine, and before Whitney could complete his model and secure the patent a number of machines were in successful operation. These were all constructed on the same general principle as Whitney's, but with some slight deviations to evade the penalty of violating the patent right.

A partnership being formed by Messrs. Miller and Whitney for making and working the cotton gin, for so the machine was called, the latter returned to Connecticut and commenced the manufacture of machines. A series of law suits was soon after commenced for infringements of their patent, by the expense and delays of which their affairs became embarrassed and to add to their other

calamities, in the spring of 1795, their shop, with all their tools, machines and papers, which were in it, were consumed by fire. Our limits will not allow us to enter into particulars respecting their numerous law suits. We can only say that surreptitious gins were erected in all parts of the country—that it was several years before any of their suits terminated favorably—and that although they ultimately triumphed, the trouble and expense of obtaining verdict generally equalled the amount of damages awarded.

In 1801 the Legislature of South Carolina purchased the patent of Miller and Whitney for that state, for the sum of 50 thousand dollars, 20 thousand of which they paid in hand. In 1802, an arrangement was made with North Carolina by which it was stipulated that Miller and Whitney should receive 2 shillings and 6 pence annually for five years, for every saw used in the gins in that state. Some of the gins had 40 saws. In 1803 a similar arrangement was made with Tennessee. But the money received from these sources was mostly expended in carrying on the law suits in Georgia. In 1812 the time having expired for which the patent was granted, Whitney applied to Congress for a renewal of it, but without success. This invention, which cost Whitney so much labor and vexation, and afforded him so little compensation, as early as 1812, added no less than 3 millions of dollars annually to the value of the productions of the southern states, over and above what it would have been without it and the amount of profit derived from it at this time is incomparably greater. It is calculated that the southern states would have been great gainers, by paying 100 millions of dollars for this invention, if they could not have had it without.

In 1798, Mr. Whitney having relinquished the high hopes, which he had indulged, of acquiring wealth by his cotton gin, turned his attention to another object. This year he contracted to manufacture for the United States ten thousand stand of arms, for which he was to receive one hundred and thirty four thousand dollars. For this purpose he erected works about two miles from the city of New Haven at the place now called Whitney-ville. In the accomplishment of this business he had obstacles to encounter, which would have discouraged a man of ordinary genius; but these were all finally surmounted, and his labors were crowned with abundant success. The machinery was mostly of his own contriving and,

like the cotton gin, evinced the inventive powers of his wonderful mind.

In 1812 Whitney, having fulfilled his former engagement to the satisfaction of his employers, entered into a new contract with the United States for the manufacture of an additional quantity of 15000 stand of arms; and, having this year failed in his attempt to obtain a renewal of his patent for the cotton gin, he devoted himself during the remainder of his life to the manufacture of arms, in which he greatly excelled, and to the improvement of machinery used in that business.

In January, 1817 Whitney was married to Miss Henrietta F. Edwards, daughter of the Hon. Pierpoint Edwards, by whom he had four children, a son and three daughters. Happy in his home easy in his circumstances, with respectability among his fellow citizens, and celebrity abroad, he now had in prospect, after a day of anxiety and toil, an evening bright and serene. But his delightful evening was not long to last. In September 1822, he was attacked by the disorder, which finally terminated his life. After being for six weeks confined to his room, he so far recovered, as to be able to walk about and enjoy the society of his friends. Early in January, 1823, he had another severe attack, and, with alternate awful suffering and partial repose, he reached the 12th of November 1824, from which time his distress was almost unremitted until the 8th of January, 1826, when he expired, retaining his consciousness to the last.

For the Green Mountain Repository.

SCHOOL BOOKS.

Almost every thing in this present world partakes of a mixed character. Scarcely any good exists unalloyed by an attendant evil. While improvements are going forward rapidly, and much is done for the melioration of the condition of man, these very improvements are attended by evils, which would not otherwise have had existence. The truth of this remark will be sufficiently obvious by a glance at the recent improvements in elementary school books. While very much has been done thereby to facilitate the diffusion of useful knowledge, and to promote the general cause of education, the multiplication of books, necessarily attendant upon these improvements has occasioned evils neither few nor inconsiderable. It appears at first view somewhat paradoxical that an

increase of books should be unfavorable in any degree to the dissemination of knowledge, but we are satisfied that an attentive examination of the subject, will convince every individual that this is the fact. In almost every department of science and literature, there is at present a very large number of elementary books, all designed for the same class of learners and these perhaps many of them possessing nearly equal merits. In such cases it becomes very difficult, even for those skilled in the business of instruction, to make selections and much more so for novitiates at the business. Hence we are to expect diversity of opinions among teachers, and this diversity joined with the want of permanency in the business of teaching, is the source of continual embarrassment in the greater part of our schools. A teacher is employed for three, or perhaps four, months. He has his predilections,—the books before used, in the school must be discarded, and his favorite authors introduced. The next winter these last must be laid aside in conformity to the likes and antipathies of a succeeding teacher, and thus matters go on from year to year.

Now this course not only subjects parents to much unnecessary inconvenience and expense, but it at the same time produces a very baneful influence upon the minds and habits of children. At an age when the extent of their knowledge is so limited that they are unable to take general views of the several sciences, but are, from the nature of the case, necessarily obliged to take up in succession the several parts of each and pursue them, one at a time, and when they discover the discrepancies in the different books, on the same subject which arise from omissions, or from the different methods of treating it, their minds become unsettled and they know not whether they understand the subject or not. It is almost always the case that young children, who have studied the same subject in several different books, have very little confidence in their own attainments. They know that in some things the books they have studied disagree, and this leads them to distrust the whole. Hence they are continually perplexed with doubts and uncertainties, and these serve to annihilate their hopes and to suppress their ardour in the pursuit of science.

These remarks are not made, with a view to discourage improvements in school books, but rather to discourage the publication of new elementary school books, which are *not* improvements upon

those already in use. It is too much the fashion of the present day to get up *new* publications out of *old* materials—to palm new works upon the community which contain nothing new but the dress and arrangement. Nor would we complain of this, when such improvements in arrangement are introduced as really to facilitate the communication of knowledge and subserve the cause of science. The manner of giving instruction is no less important, or less susceptible of improvement, than the matter. But we would solemnly protest against the present unparalleled multiplication of new school books, which can lay claim to improvements in neither of these particulars. When school books are so numerous, as they are at present, it is not a sufficient recommendation of a *new one* that it is equal to those already in use. It should excell, or it should not be countenanced—it should excell, or the expense to parents and the embarrassments to teachers and pupils will greatly outweigh the advantage of a change.

The aspirants to the fame of authorship may fancy that they abound in originality—that their works contain important improvements upon the labors of their predecessors—and that they are either smoothing the pathway of the student, or enlarging the boundary and increasing the light of knowledge, while they are in fact throwing obstacles in the way of the former and obscuring the light of the latter. No saying is more true than that *authors are not suitable judges of their own works.* Hence the importance, both to writers themselves and to the public generally, of judicious, impartial and enlightened criticism.

For the Green Mountain Repository.

WORCESTER'S DICTIONARY.

Although the Dictionaries of the English language were numerous and many of them possessed of very great merits, there was not, in our opinion, previous to the publication of Worcester's Pronouncing and Explanatory Dictionary, any one equally well adapted to the wants of our common schools. The full works of Johnson, Perry and Walker, were too large and expensive for common use in our primary schools, and the abridgements of these works, which have been more generally used, are so meagre and deficient in words of frequent occurrence as to be by no means satisfactory; and the same remark is equally applicable to the

elaborate work of Doct. Webster and its abridgement, which have been more recently published.

We are gratified to learn that Worcester's Dictionary is getting into very general use in this section of the country—that several large editions have been published and sold by Mr. Goodrich within the last 18 months; and we cannot better express our own views of the work than by copying the following candid and judicious remarks, from the pen of a person, whose occupation and pursuits entitle his opinions, on this subject, to the greatest deference.

"The competition in such works (Dictionaries) is now such, and so many peculiar claims are urged in favor of each, that it would perhaps seem invidious to present any one as in all respects superior to every other. Of Worcester's we have only to say that the author has performed his task with great industry, fidelity and good judgment, that it is just what it claims to be, and fulfills remarkably well the conditions required in such a work. It contains in the compass of a small volume a vocabulary of 43,000 words with definitions, concise indeed necessarily, yet judiciously made, and sufficient for common use. As a vocabulary of words for which an intelligent reader would consult a dictionary, it is one of the largest in the language, and will seldom be consulted in vain. The principles followed by the author in regard to orthography and orthoepy are very clearly stated in the preface, and will be approved, we think, by most of those who are in the habit of attending to matters of this sort. The introduction of some new things in the notation common to this with other Dictionaries recently published, and the omission of the final *k*, as also of the *u* in the last syllable of many words in which they were formerly written, are points about which scholars can hardly be expected entirely to agree in opinion, and indeed about which few have formed an opinion with much care. Mr. Worcester shews that he has considered the subject maturely, and has not adopted his opinion without knowing the objections to which it is exposed. The explanation of words and phrases from foreign languages most common in English books and pronouncing vocabularies of Greek and Latin and Scripture proper names, increase the practical utility of the work."

ORIGIN OF THE STOCKING LOOM.

In a pamphlet published by one Aaron Bell, in the year 1715, entitled, 'An account of the rise and progress of the Beech Oil invention,' &c., is the following narrative. It is not out of some men's remembrance, that a young gentleman, of no fortune, student at Oxford, fell in love with an innkeeper's daughter of that town, whose circumstances were also very narrow. He had philosophy enough to despise superfluous wealth, and judgment to foresee the necessity of a competence, but love was headstrong, and too hard for reason, so that after a year or two's ineffectual delay, they bid defiance to their stars, and had courage enough to marry. The scholar gained a wife and lost a fellowship, the only subsistence he before depended on. Our inkeeper often upbraided the bridegroom with the barren effects of his learning, and thought it very strange, as he well might, that while every body told him his son-in-law was a great scholar, his whole stock of knowledge could not help him to one penny of his own getting. Six or seven months after his marriage, the father-in-law died miserably poor; and the credit which his industry maintained in his life-time dying with him, the goods he left behind were seized on by his creditors, and the student and his young wife turned out of doors, to cut the bread of fortune where they could best find it.

The wife had a relation in town, unable to contribute any great assistance. She took them however, into a garret of her house where the man could only waste his hours between looks and sighs, while the partner of his sorrows made hard shift to pick up a support by knitting stockings, at a certain common price for every pair. At last by a very natural coincidence the cares of the, lady became more weighty, and the patience of both less fortified. The only subject of their conversation now was their dread of what would become of their poor infant who was born a beggar; but sitting constantly together from morning to night, the scholar often fixed his eyes, with steadfast attention on the motion of his wife's fingers in the dexterous management of her needles; he took it into his imagination that it was not impossible to contrive a little loom, which might do the work with much more expedition. this thought he communicated to his wife; and joining *his* head to *her* hands, the endeavor succeeded to their wishes. Thus the ingenious stocking-loom, which is so common now, was first in-

vented, by which the inventor did not only make himself and family happy, but has left this nation indebted to him for a benefit which enables us to export silk-stockings in great quantities, and to a vast advantage, to those very countries from whence before we used to bring them at considerable loss in balance of our traffic.—*London Mechanic's Magazine.*

From Turner's Chemistry.

SUGAR.

Sugar is an abundant vegetable product, existing in a great many ripe fruits, though few of them contain it in sufficient quantity for being collected. The juice which flows from incisions made in the trunk of the American maple tree, is so powerfully saccharine that it may be applied to useful purposes. Sugar was prepared in France and Germany during the late war from the beet-root; and Proust extracted it in Spain from grapes. But all the sugar at present used in Europe is obtained from the sugar-cane *(Arundo saccharifera)* which contains it in greater quantity than any other plant. The process, as practised in our West India Islands, consists in evaporating the juice of the ripe cane by a moderate and cautious ebullition, until it has attained a proper degree of consistency for crystallizing. During this operation lime water is added, partly for the purpose of neutralizing free acid, and partly to facilitate the separation of extractive and other vegetable matters, which unite with the lime and rise as a scum to the surface. When the syrup is sufficiently concentrated, it is drawn off into shallow wooden coolers, where it becomes a soft solid composed of loose crystalline grains. It is then put into barrels with holes in the bottom, through which a black ropy juice, called molasses or treacle, gradually drops, leaving the crystallized sugar, comparatively white and dry. In this state it constitutes the raw or muscovado sugar.

The raw sugar is farther purified by boiling a solution of it with white of eggs, or the serum of bullock's blood, lime water being generally employed at the same time. When properly concentrated, the clarified juice is received in conical earthen vessels, the apex of which is undermost, in order that the fluid parts may collect there, and be afterwads drawn off by the removal of a plug.

In this state it is loaf or refined sugar. In the process of refining sugar, it is important to concentrate the syrup by a low temperature; and on this account a very great improvement was introduced some years ago by conducting the evaporation in *vacuo*.

Pure sugar is solid, white, inodorous, and of a very agreeable taste. It is hard and brittle, and when two pieces are rubbed against each other in the dark, phosphorescence is observed. It crystallizes in the form of four or six-sided prisms bevelled at the extremities. The crystals are best made by fixing threads in syrup, which is allowed to evaporate spontaneously in a warm room, and the crystallization is promoted by adding spirit of wine. In this state it is known by the name of *sugarcandy*.

Sugar undergoes no change on exposure to the air; for the deliquescent property of raw sugar is owing to impurities. It is soluable in an equal weight of cold, and to almost any extent in hot water. It is soluble in about four times its weight of boiling alcohol, and the saturated solution, by cooling and spontaneous evaporation, deposits large crystals. When the aqueous solution of sugar is mixed with yeast, it undergoes the vinous fermentation.

Sugar is very easily effected by heat, acquiring a dark colour and burned flavour.*

On the Uses of the Mustachial Bristles of Animals,

BY VROLICK OF AMSTERDAM.

Being convinced (says Vrolick) that the mustaches of several mammifera, such as the seal and cats, are peculiar organs of touch, I made choice of the rabbit for trying some experiments upon the subject. This animal passing the greater part of its life in warrens, where the light cannot penetrate, this circumstance seemed to me to render it better adapted for the object of the inquiries which I had proposed to myself, its mustaches being also long and pretty numerous. I found in this animal the same division and distribution of the nervous filaments, in the bulbs of the mustaches as in seals and cats in general, a circumstance which removed all my doubts with regard to the use of these parts. However, not contented with this proof, derived from analogy

* On this account most of the maple sugar made in Vermont is nearly spoiled in manufacturing. If manufactured with the same care it would be in no respect inferior to muscovado sugar.

of structure, I wished to make some direct experiments, of which the following are the results. I arranged upon the floor of a large room a quantity of books, in such a manner as to form a sort of labyrinth, through which an animal of moderate size could with difficulty find a passage. I placed a rabbit in the middle of this labyrinth having previously taken care to produce such a degree of darkness, as to render it impossible to distinguish any object whatever. On admitting the light a few moments after, I found the animal escaped from its prison, after finding a passage through the whole of these books, without having overturned or displaced one of them, although they were placed so near to one another that the smallest shock would have been sufficient to make them fall. In order to determine whether its sight had enabled the animal to escape from its prison, I tied up its eyes first with a piece of linen, which I tightened well, and made several folds of, and afterwards with a piece of crape folded double, and bound down, to prevent all mistakes, by means of a crucial bandage. In both cases the animal walked with great ease among the books, without knocking against any thing, even when forced to accelerate its progress. I was very curious to observe, during this experiment, the motion of the head, by which the animal seemed to have in view to measure the distance of objects; when it approached them, it touched them with the extremity of its mustaches. In order to remove all doubt from my mind, I cut the mustaches situated at the side of the head, and those placed around the eyes. The animal was bound up again as it had been before, but now it seemed afraid to move; it knocked against the books, overturned several of them, and could only escape by sliding along, as a blind man would do who directed himself by a wall.

Edinb. Philos. Journ.

MUD VOLCANOES.

What may be termed *mud volcanoes*, from their having eruptions of mud only, are a very curious phenomenon. One of these, which is situated towards the middle of the island of Java, in a plain abounding with salt springs, is thus described in the 9th volume of the *Batavian Transactions*: "On approaching it from a distance, it is first discovered by a large volume of smoke, rising and disappearing at intervals of a few seconds, resembling the va-

pours arising from a violent surf: a dull noise is heard, like that of distant thunder. Having advanced so near, that the vision was no longer impeded by the smoke, a large hemispherical mass was observed, consisting of black earth mixed with water, about 16 feet in diameter, rising to the height of 20 or 30 feet in a perfectly regular manner, and, as it were, pushed up by a force beneath—which suddenly exploded with a dull noise, and scattered about a volume of black mud in every direction. After an interval of two or three, or sometimes four or five, seconds, the hemispherical body of mud or earth rose and exploded again. In the same manner this volcanic ebullition goes on without interruption. The spot where it occurs is nearly circular and perfectly level; it is covered only with the earthy particles, impregnated with salt water, which are thrown up from below: the circumference may be estimated at about half a mile. A strong, pungent, sulphureous smell is perceived on standing near the explosion, and the mud recently thrown up is warmer than the surrounding atmosphere. During the rainy season these explosions are more violent."

The mountain of *Maccaluba* in Sicily, and some hills at the town of Taman in the Crimea, are also distinguished by eruptions of mud.—*Lib. Use. Knowledge.*

OIL OF BIRCH BARK.

The Russians obtain this oil by filling a large earthen pot with the thin, whitish, paper-like, external bark of the birch tree, carefully separated from the coarse bark, closing the mouth of this pot with a wooden bung, pierced with several holes; and then turning it over, and luting it with clay to the mouth of another of the same size. A hole being dug in the ground, the empty pot is buried in it, and a fire is lighted round and over the pot containing the bark, which is continued for some hours, according to the size of the pot. When the apparatus is cooled and unluted, the lower pot contains the brown oil, mixed with pyroligneous tar, and swimming on an acid liquid.

In some places iron is used for this purpose, and the bark is hindered from falling into the lower pot by a plate of iron, pierced with holes; 100 pounds of bark yield about 60 of oil.

This oil is used in Russia for currying leather, to which it gives a peculiar odour, and a power of resisting moisture, far beyond any

other dressing. Its use seems to have arisen from observing that the thin, paper-like leaves of birch bark remained after the coarser part to the bark and the timber of fallen trees had rotted. The oil appears to owe this quality to a resin, which, by this mode of distilling, per descensum, is allowed to escape in a great measure from the action of fire, and drop into the lower pot.—*Op. Chemist.*

Form of Hail-Stones.—Whilst ascending the Volcano of Puracé in the Andes, M. Humboldt had occasion to observe, that during a hail-storm, the hail-stones, which were white, from five to seven lines in diameter, and formed of layers of different translucency, were not merely very much flattened at the poles, but were so much swelled in their equatorial dimensions as to have rings of ice separate from them on the slightest blow. M. Humboldt had twice previously observed this phenomenon in the mountains of Bareuth and near Cracovia, during a journey in Poland. "May it be admitted that the successive layers which are added to the central nucleus are in a state of fluidity sufficient to allow of the flattening of the spheroids being caused by a rotatory movement?

Ann. de Chim.

TO MAKE SEALING WAX.

Those who use large quantities of sealing wax may find it economical to make it, which is very easy. Take equal weight of gum lac, vermillion and pure Venice turpentine. Melt them over a gentle heat, and stir them well together. Take a detached portion of the mass and roll it with the hand upon a plate of copper slightly heated; or rather it may be cast in a mould made on purpose, of plaster, of horn, or of copper. Instead of vermillion, other colors may be used, according to the tint which it is desired that the wax may have.—*Jour. de Connois, &c.*

To prevent Iron and Steel from rusting: heat it till it burns the hand; then rub it with pure white wax. Warm it a second time so as to melt and divide off the wax, and rub it with a piece of cloth, or leather, until it shines well. This simple operation, by filling all the pores of the metal, defends it completely from rust, even though it should be exposed to moisture.—*Idem.*

METEOROLOGICAL

BURLINGTON, Vt., Lat. 44° 27′. Long. 73° 14′. Altitude above Lake

1832.		*Thermometer.*			*Barometer.*			RAIN	*Winds.*		
FEB.		S. R.	1P.M.	9 EV.	S. R.	1 P.M.	9 EV.	Inch's	Morning.	Noon.	Evening.
1	4	5	22	14	30.00	30.00	29.90		N. W.	N. W.	S.
2	5	28	34	37	29.60	29.40	29.30	.07	S.	S.	S.
3	6	32	36	28	29.60	29.55	29.50		N. W.	N. W.	S.
4	7	24	34	18	29.55	29.55	29.60		N. W.	N.	N.
5	A	2	4	—4	29.65	29.70	29.90		N.	N.	N.
6	2	0	16	16	30.05	29.90	29.60		S.	S.	S.
7	3	14	23	13	29.80	29.80	29.90	.23	N. W.	N.	N.
8	4	4	14	8	30.10	30.10	30.00		N.	N.	N.
9	5	2	22	18	29.95	29.90	29.50		N.	S.	S.
10	6	11	22	20	29.70	29.75	29.80	.17	N.	N.	N.
11	7	9	25	32	30.10	29.90	29.70		N.	S.	S.
12	A	42	38	30	29.10	29.00	29.10		S.	N.	N.
13	2	24	30	20	29.55	29 70	29.90	1.21	W.	W.	W.
14	3	20	28	25	30.25	30.00	30.10		N.	N.	S.
15	4	30	26	14	29.90	29.90	30.15		S.	N.	N.
16	5	—2	2	—8	30.35	30.45	30.40		N.	N.	N.
17	6	—9	17	12	30.40	30.05	29.70		S.	S.	S.
18	7	18	33	19	29.35	29.30	29.40	.39	S. W.	S.	S.
19	A	20	26	22	29.30	29.20	29.30		N.	N.	N.
20	2	20	31	21	29.40	29.30	29.20		N.	N.	N.
21	3	16	24	10	29.40	29.50	29.80	.63	N.	N.	N.
22	4	7	27	21	30.00	29.90	29.90		S.	S.	S.
23	5	29	40	14	29.70	29.50	29.85		S.	S.	N.
24	6	—12	6	—8	30.30	30.35	30.35	.23	E.	N.	S.
25	7	1	18	15	30.15	30.00	29.80		S.	S.	S.
26	A	12	31	20	29.75	29.60	29.75	.29	S.	S.	S.
27	2	11	32	27	29.80	29.70	29.65		S. W.	S.	S.
28	3	34	39	36	29.50	29.35	29.35		S.	S.	S.
29	4	34	40	24	29.55	29.60	29.85		W.	N. W.	N. W.
MEAN		14.7	25.5	17.7	29.78	29.72	29.71	3.22	Gen'l mean Ther. 19.3		

JOURNAL.

Champlain 250 feet. Distance from the Lake, one mile East.

Weather.				Remarks.
D.	Morn.	Noon.	Even'g.	
1	*Clear*	*Clear*	*Cloudy*	Lake froze over in 1826. The first day of Feb. 1826 was the coldest day known in this place for more than 20 years. The thermometer in the morning was 26 deg's below zero, and 7 below at noon.
2	*Snow*	*Cloudy*	*Cloudy*	
3	*Cloudy*	*Clear*	*Snow*	
4	*Cloudy*	*Cloudy*	*Cloudy*	
5	*Snow*	*Snow*	*Clear*	Lake entirely frozen over.
6	*Cloudy*	*Clear*	*Snow*	
7	*Snow*	*Fair*	*Fair*	
8	*Fair*	*Fair*	*Cloudy*	
9	*Cloudy*	*Snow*	*Snow*	
10	*Cloudy*	*Fair*	*Fair*	
11	*Fair*	*Clear*	*Rain*	Lake passable on the ice in all directions.
12	*Rain*	*Rain*	*Snow*	
13	*Clear*	*Clear*	*Clear*	
14	*Cloudy*	*Fair*	*Cloudy*	
15	*Snow*	*Cloudy*	*Clear*	Smoky.
16	*Clear*	*Clear*	*Clear*	Barometer higher than ever before noticed in this place.
17	*Clear*	*Fair*	*Fair*	
18	*Snow*	*Clear*	*Fair*	
19	*Snow*	*Snow*	*Fair*	
20	*Cloudy*	*Cloudy*	*Snow*	
21	*Cloudy*	*Fair*	*Cloudy*	
22	*Fair*	*Fair*	*Clear*	
23	*Snow*	*Cloudy*	*Cloudy*	Remarkable change in the barometer and weather.
24	*Clear*	*Clear*	*Clear*	
25	*Fair*	*Snow*	*Snow*	
26	*Cloudy*	*Clear*	*Clear*	
27	*Clear*	*Clear*	*Clear*	Sleighing good, and has been through the whole month.
28	*Snow*	*Cloudy*	*Cloudy*	
29	*Cloudy*	*Fair*	*Cloudy*	The average depth of snow is now more than 3 feet.

Barometer, 29 74 inches.

Additional remaks.—It will be seen by the preceding table that the mean temperature of Feb. was 19.3°. The mean of 1826 was 23.6°—1828, 31.1°—1829, 17.4°. Range of the thermometer for Feb. 1832, from 42° above to 12° below zero, equal to 54°. Those numbers in the table having a dash before them signify so many degrees below zero. Range of the barometer from 29 inches to 30.45 inches, equal to 1.45 inch.

GREEN MOUNTAIN REPOSITORY.

We had intended that each number of the Repository should contain a brief Biographical notice of some one of those distinguished individuals to whom Vermont is indebted for her separate existence as a state, and for much that is valuable in her political and literary institutions. But not succeeding in getting materials for that purpose in season for the preparation of an article for the present number, we offer our readers in its stead a brief sketch of the life of ELI WHITNEY, Esq. the inventor of the cotton gin. He was a native of Massachusetts, but his fame is indentified with the agricultural and manufacturing interests of the Union.

SUMMARY.

Cincinnati—It is only 43 years since the site of this city was surveyed. It now contains 30,000 inhabitants. The first year a few log huts and two or three framed houses were built—during the last year more than 500 substantial edifices have been erected. The 640 acres on which the city stands originally cost 49 *dollars*—some portions of it are now selling at $30 an inch.—*Spirit of the Times.*

Population of the Canadas.—By the census taken in 1831, the population of lower Canada was found to be 504,598—of Upper Canada 235,064.—Total 739,662.

New York.—The Journal of Commerce states that the amount of duties accruing at the port of New York in 1831, was $20,000,000.

Mount Tom, Woodstock.—Mr. Marshall Conant has recently taken two measurements of this eminence. By the trigonometrical process, the result was Height of South Peak 514 feet,—North Peak 630 feet. By the barometrical process. Height of South Peak 516 feet.—North Peak 631 feet. These heights are the elevation above the site of the Court House.—*Vt. Chron.*

A New Steam Engine.—A patent has been obtained for a new steam engine, in Philadelphia. It entirely dispenses, not only with the lever beam, but nearly all the valves, rods and wheels, that render the ordinary machinery of steam engines so complex. The movements are remarkably perfect and easy, and make but little noise.—*Young Me. Magazine.*

New Light.—We called last evening at the Congress Hall, (Wells's Hotel) to see in operation a newly constructed Lamp, by which a clear, beautiful light is given without the aid of wicks, or rather without the hindrance of wicks. Common oil is placed in the bowl of the lamp, and is made to produce gas for the light. The construction is simple, and it is said the consumption of oil is 50 per cent less than in the usual mode of lighting rooms. The lamp is worthy the attention of the curious.—*U. S. Phil. Gaz.*

Pandora's Box.—The Prince of Piedmont was not quite seven years old, when his preceptor, Cardinal (then Father) Glendel, explained to him the fable of Pandora's Box. He told him that all evils which afflict the human race were shut up in that fatal box; which Pandora, tempted by curiosity, opened, when they immediately flew out, and spread themselves over the surface of the earth.

"What Father?" said the young prince, "were all the evils shut up in that box?"

"Yes," answered the preceptor,

"That cannot be," replied the prince, "since curiosity tempted Pandora; and that evil, which could not have been in it, was not the least, since it was the origin of all."—*Atheneum.*

Life.—Life is a game, which depends mostly upon good play, and partly on good fortune. If a man play well, if he is positive he could not have played better, though fortune be against him and he be beaten, his defeat causes no mortification: he reposes upon the satisfaction of having done as well as possible. If a man knows he has played badly, and might have played better, though fortune give him the victory, he does not derive much pleasure from his success. Thus our happiness is in our own hands. Industry and attention will teach us the game, and if we be proficients, fortune cannot deprive us of our enjoyments.

POETICAL DEPARTMENT.

For the Repository.

HUMAN LIFE.

Ah! what is man?—a plant—a flower,
Which, nursed by sunshine and by shower,
Throws for awhile its fragrance round,
And then lies withering on the ground.

And do we live? and is our stay
A post's?—we're here and then away
To try those unknown regions where
The disembodied spirits are.

This "mortal coil" we must aside,
And launch upon that boundless tide
On which immortal souls must sail,
With prosperous winds, or adverse gale.

Then let us walk its shore with dread,
Nor temp'ral winds, nor tempest head,
But trust in Him, whose arm can save
From storms and pains beyond the grave.

Yea, trust in Him whose grace alone,
Can save, and seal us for his own;
Can free from death and help us rise
To His bless'd presence in the skies.

Q.

For the Repository.

SLANDER.

If we go back to earliest time,
By hist'ry, or tradition known,
The records search in prose and rhyme,
Through every age down to our own,
We sure shall find since time began
Man has traduced his fellow man:

Has wandered from his own straight way,
On diverse errands not his own,
To throw out hints, or somewhat say,
To make his neighbor's foibles known,
Thereby to tarnish his good name,
Or rob him of his well earn'd fame.

But ne'er till now, since man was made,
Did men themselves so much debase,
As to make sland'ring all their trade—
To glory in their own disgrace—
And falsify, when truth to tell
Would serve their purpose quite as well;

Assert what false full well they know,
And swear it all as true as bible;
Nor blush for shame, when others show,
'Tis all a base malicious libel;
But to divert the public mind,
Probe their black hearts new *slang* to find.

Great Jove, this wantonness restrain!
Haste this Mercurial age away—
And O! let decency again
O'er tongue and pen resume her sway;
Then may we hope for better times
For modest prose and chaster rhymes.

HORACE, JR.

The following welcome to the POLES first appeared in the Burlington Sentinel of February 17. It is, we are informed, the production of a young Lady,—a daughter of our mountain State—from whom that paper has frequently received contributions, which are highly creditable to their fair author. We shall ever take pleasure in filling our pages with the productions of our own neighborhood, when we consider them worthy of preservation, in preference to those from abroad; and we trust that we shall not be wholly forgotten by those who wield the pen and woo the Nine. Our natural scenery is not lacking in loveliness and beauty—the events of our history are not deficient in magnitude and interest, for awakening the spirit of inspiration, and we believe that our sons and daughters are not wanting in genius to compete successfully for the meed of fame.

"COME, BE FREE."

SON OF POLAND! welcome thou—
Welcome to our happy home;
No victor's wreath entwines thy brow,
Yet, NOBLE PATRIOT, come—O, come!

We have a wreath which thou may'st wear—
A wreath by KOSCIUSCO won,
Who to our foe his breast laid bare,
And fought beside our WASHINGTON.

He fought—he conquered—and his name
Is pass-word for his nation's sons—
And thou shalt share that dear-bought fame,
Yes—THOU, and ALL thy homeless ones.

Come bring thy daughters—bring thy wives—
Our sisters shall their sisters be,—
We will protect them with our lives—
Then come, POLANDER, and BE FREE!

No tyrant's chain shall bind thee, here,
Nor petty prince's galling yoke—
No ties, to wring the heart's warm tear,
Shall wantonly be torn or broke.

America hath open arms
For every patriot son on earth—
And LIBERTY, with all its charms,
She claims, and boasts its natal birth.

OH, COME, POLANDER—leave thy chains,
Our starry banner waves for thee—
And we have cities—we have plains,
Have peace, have plenty—COME, BE FREE!

ADA.